IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Provisional Application of:
Yong Cheol PARK

Application No.: 60/469,005	Confirmation No.: 6166
Filed: May 9, 2003	Art Unit: N/A
For: METHOD FOR RECOVERING DISC MANAGEMENT INFORMATION FROM OPTICAL DISC WRITE ONCE	Examiner: Not Yet Assigned

LETTER SUBMITTING ENGLISH TRANSLATION OF PROVISIONAL APPLICATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This provisional application was filed in a language other than English, and an English-language translation of this provisional application and a statement that the translation is accurate were not previously filed either in this provisional application or any related non-provisional application(s).

In accordance with 37 C.F.R. § 1.78(a)(5), Applicant submits herewith an English translation and Verification of Translation of the above-identified Provisional Application No. 60/469,005 filed on May 9, 2003.
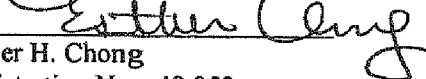
If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Dated: April 16, 2009   Respectfully submitted,

By _____
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Attachments: English Translation of Provisional Application No. 60/469,005

Statement of Accurate English-Language Translation

EHC/MEM/rtl

CERTIFICATE OF VERIFICATION

I, Gil Jin Young of Patrea Co.,Ltd., 1105 Rm. Yeosam bldg. 648-23, Yeoksam-dong, Ganam-gu, Seoul, Republic of Korea state that the attached document is a true and complete translation to the best of my knowledge of the Korean-English language and that the writings contained in the following pages are correct English translation of the specification of the Provisional Application No. 60/469,005.

Dated this 29th day of 2008

Signature of translator: _____

Name: _____Gil Jin Young_____

DEFECT MANAGEMENT FOR WRITE-ONCE RECORDING MEDIA

❖ Description of Background Art

• In order to implement a Defect Management (DM) in BD-WO, DMS(DDS and DFL) should be updated and, this information is recorded as TDFL or TDDS form in TDMA area. (TDMA information comprises TDFL and TDDS.)

• In TDDS, as a whole structure information of a disc, not only spare area size and each area information like the case of BD-RE, but also LRA, OPC, and Spare area use information, and TDFL pointer and so on are recorded.

• In TDFL, defect information occurred in use is recorded. Once a defect occurs, it is updated at an appropriate cycle.

• TDFL and TDDS information is updated at an appropriate cycle.

• Before the latest TDFL and TDDS is recorded in the disc, in cases of not being updated due to an error by power-failure or of not being able to read the latest TDDS (nth) due to scratch, finger printer, etc., even though updated, it may be a problem to find out the latest disc information. Accordingly, the present information is to provide a recovery method for this matter.

° BD-WO: Blu-ray Disc – Write-Once (Disc); TDMA: Temporary Defect Management Area
TDFL: Temporary Defect List
TDDS: Temporary Disc Definition Structure   1/4

❖ Representative information to be recovered

- Last Recorded Address.
- Space bitmap
- Last PSN of the used OPC Zone
- TDFL

❖ Method for recovering OPC information

▢ Information to be recovered

OPC Zone

Last PSN of
The used
OPC zone

Using order
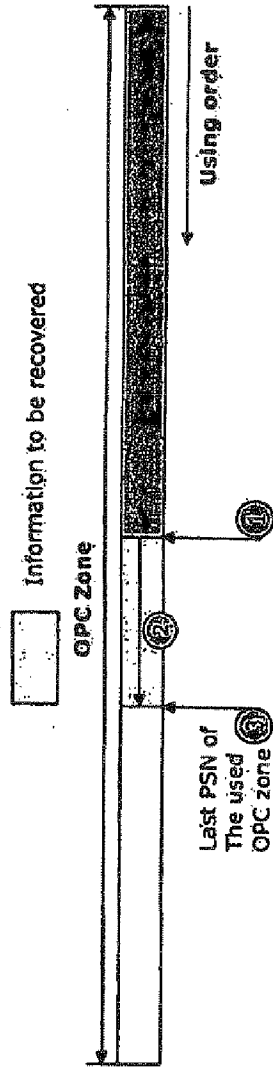
- Step 1 : Read OPC area use information recorded in the (n-1)th TDDS
- Step 2 : Search recorded/unrecorded area after detecting RF wave form
- Step 3 : Find out correct OPC use information, update it in TDDS

(Note) Though it is possible to find start point in unrecorded area by using RF search whole of OPC zone,
It is possible to reduce whole of the search time by using the past TDDS information recorded in TDMA.

- PSN: Physical Sector Number
OPC: Optimum Power Control

❖ Method for recovering LRA and SBM information

☐ Information to be recovered

● Recover LRA and SBM information using the same method as one for recovering OPC area

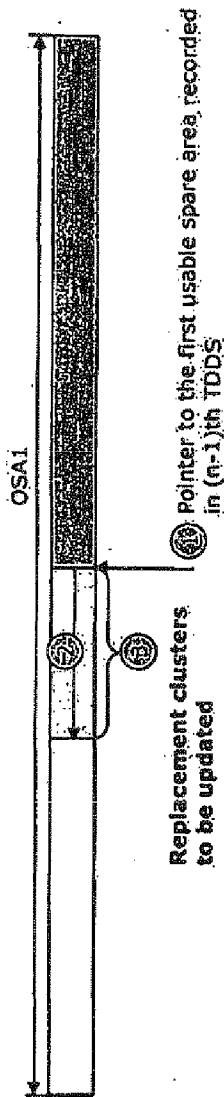● In a case of displaying Disc record state using LRA

LRA1 | Updated LRA1

LRA2 | Updated LRA2

● In a case of displaying Disc record state using SBM

* LRA: Last Recorded Address
  SBM: Space Bit Map

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METHOD FOR RECOVERING DFL INFORMATION

❖ A Case of OSA1 (example)

OSA1

Replacement clusters to be updated

㉓ Pointer to the first usable spare area recorded in (n-1)th TDDS

- Step 1 : By using TDFL pointer recorded in (n-1)th TDDS, recover (N-1)th Defect list reading (n-1)th TDFL list, and read the first usable spare entry pointer information in each spare area recorded (N-1)th TDDS.

- Step 2 : Observe RF wave form, and search recorded/unrecorded area to find out unrecorded area.

- Step 3 : Read replacement clusters not recorded in (n-1)th TDFL from the area found out in Step 2.

- Step 4 : Extract necessary information for TDFL entry composition by reading Access block of each cluster read.
  (EX) From Address unit of Access Block -> PSN of replacement cluster
  From User control block of Access Block -> PSN of defective cluster

  (Note) For the above recovery process, if a defective cluster is recorded as a replacement cluster in spare area, it is necessary to record defective cluster address in a user control block of the replacement cluster.

- Generate defect list using the above information to update it in DFL.
- Correct TDFL can be recovered by applying the above process to each assigned spare area.

Please type a plus sign (+) inside this box → ⊞

PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53 (c).

Express Mail Label No.

INVENTOR(S)

Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
Yong Cheol	PARK	Gyeonggi-do, Republic of Korea

☐ Additional inventors are being named on the _____ separately numbered sheets attached hereto

TITLE OF THE INVENTION (280 characters max)

DEFECT MANAGEMENT FOR WRITE-ONCE RECORDING MEDIA

CORRESPONDENCE ADDRESS

Direct all correspondence to:

☒ Customer Number   30593   →   **30593**

OR   Type Customer Number here

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ENCLOSED APPLICATION PARTS (check all that apply)

☐ Specification Number of Pages   4   ☐ CD(s), Number

☐ Drawing(s) Number of Sheets   ☐ Other (specify)

☐ Application Data Sheet. See 37 CFR 1.76

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT (check one)

☐ Applicant claims small entity status. See 37 CFR 1.27.

☒ A check or money order is enclosed to cover the filing fees   FILING FEE AMOUNT ($)

☐ The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: 08-0750   160

☐ Payment by credit card. Form PTO-2038 is attached.

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are: _____.

Respectfully submitted,
SIGNATURE

TYPED or PRINTED NAME   Terry L. Clark

TELEPHONE   703-668-8000

Date	5/9/2003
REGISTRATION NO. (if appropriate)	32,644
Docket Number:	46500-000117/US

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

DEFECT MANAGEMENT FOR WRITE-ONCE RECORDING MEDIA

❖ Description of Background Art

- BD-WO에서 Defect Management (DM)를 수행하기 위해 DMS (DDS, DFL) 를 update 해야 하며, 이 정보를 TDFL, TDDS로 TDMA 영역에 기록한다 (TDMA 정보는 TDDS 및 TDFL로 구성됨)

- TDDS에는 disc 전체 구조에 대한 정보로, BD-RE에서와 같이 spare 영역 크기 및 각 영역에 대한 정보 뿐만 아니라, BD-WO에서만 필요한 정보 즉, LRA, OPC 영역 사용 정보, Spare 영역 사용 정보, TDFL에 대한 pointer 등이 기록된다.

- TDFL에는 사용 중에 발생한 defect 정보가 기록되며, defect가 발생하면 적당한 주기로 update된다.

- TDFL 및 TDDS 정보는 TDMA 영역에 적당한 주기로 update된다

- 최신의 TDFL 및 TDDS를 disc에 기록하기 전에 power-failure와 같은 이유로 update하지 못했거나, 기록되었던 하더라도 read 시 scratch, finger printer등과 같은 이유로 error가 발생하여 latest TDDS (nth)를 읽지 못하는 경우, 최신의 disc 정보를 찾아야 하는 문제가 발생하며, 본 발명에서는 이에 대한 recovery method를 제시하고자 한다.
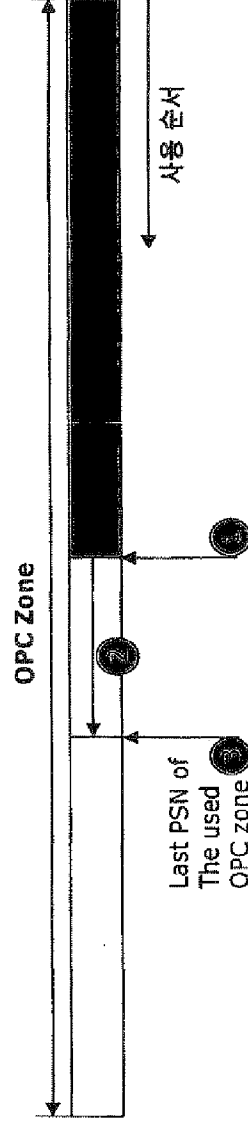
* BD-WO: Blu-ray Disc - Write-Once (Disc), TDMA: Temporary Defect Management Area
TDFL: Temporary Defect List
TDDS: Temporary Disc Definition Structure

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❖ 복원하고자 하는 대표적인 정보

- Last Recorded Address
- Space bitmap
- Last PSN of the used OPC Zone
- TDFL

❖ OPC 정보 복구 방법

복원해야 할 정보

OPC Zone

Last PSN of
The used
OPC zone

사용 순서

- Step 1 : (n-1)th TDDS에 기록되어 있는 OPC 영역 사용 정보를 읽음
- Step 2 : RF 파형을 관찰하여 기록/미 기록 영역 search
- Step 3 : 올바른 OPC 사용 정보 파악, TDDS에 update함.

(Note) OPC Zone 전체를 RF search하여 미 기록영역의 start point를 찾을 수 있으나, TDMA에 기록되어 있는 과거 TDDS 정보를 이용함으로써 전체 search 시간을 줄일 수 있다

* PSN: Physical Sector Number
OPC: Optimum Power Control

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❖ LRA, SBM 정보 복구 방법

복원해야 할 정보

- OPC 영역 복원 방법과 동일한 방법을 사용하여 복원함.
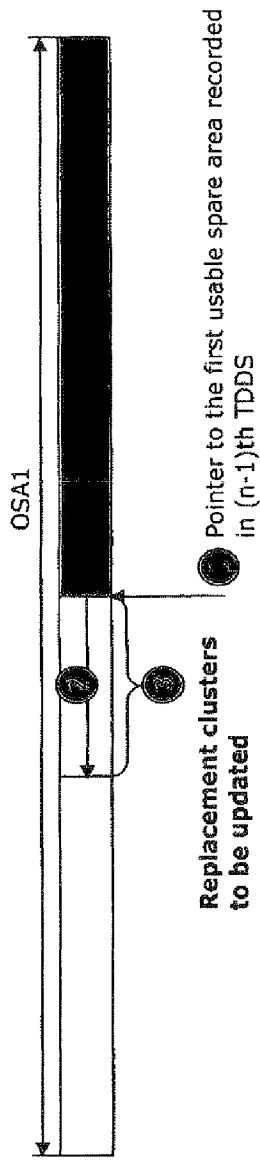
- Disc 기록 상태를 LRA로 표시하는 경우

LRA1 | Updated LRA1

LRA2 | Updated LRA2
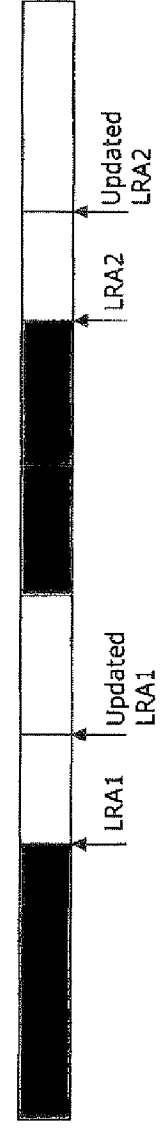
- Disc 기록 상태를 SBM으로 표시하는 경우

* LRA: Last Recorded Address
  SBM: Space Bit Map

□ DFL 정보 복구 방법

❖ OSA1의 경우 (example)

OSA1

Replacement clusters to be updated

Pointer to the first usable spare area recorded in (n-1)th TDDS

- Step 1 : (n-1)th TDDS에 기록되어 있는 TDFL pointer를 이용, (n-1)th TDFL list를 읽어 (N-1)번째까지의 Defect list를 복구하고, (N-1)th TDDS에 기록되어 있는 각 spare 영역의 first usable spare entry pointer 정보를 읽는다.

- Step 2 : RF 파형을 판정하여 기록/미 기록 영역 search하여 미 기록 영역 위치 파악

- Step 3 : Step 2에서 구한 위치부터 (n-1)th TDFL에 기록되어 있지 않은 replacement cluster를 read 함

- Step 4 : 읽어드린 각 cluster의 Access block을 읽어 TDFL entry 구성에 필요한 정보를 추출
  (EX) From Address unit of Access Block -> PSN of replacement cluster
  From User control block of Access Block -> PSN of defective cluster
  (Note) 위의 복원 작업을 위해 defective cluster를 spare area에 replacement하여 기록하는 경우,
  user control block에 defective cluster의 address를 기록해 놓는 것이 필요함.

- 위의 정보를 이용하여 defect list를 생성하여 DFL에 update한다.

- 위의 process를 할당되어 있는 spare 영역에 대해 각각 적용하여 올바른 TDFL를 복원해 낼 수 있다.

United States Patent & Trademark Office
Office of Initial Patent Examination

Application papers not suitable for publication

SN _60469605_   Mail Date _05-09-03_

☒ Non-English Specification

☐ Specification contains drawing(s) on page(s)_____ or table(s)_____

☐ Landscape orientation of text   ☐ Specification   ☐ Claims   ☐ Abstract

☐ Handwritten   ☐ Specification   ☐ Claims   ☐ Abstract

☐ More than one column   ☐ Specification   ☐ Claims   ☐ Abstract

☐ Improper line spacing   ☐ Specification   ☐ Claims   ☐ Abstract

☐ Claims not on separate page(s)

☐ Abstract not on separate page(s)

☐ Improper paper size -- Must be either A4 (21 cm x 29.7 cm) or 8-1/2"x 11"

     ☐ Specification page(s)_____   ☐ Abstract

     ☐ Drawing page(s)_____   ☐ Claim(s)

☐ Improper margins

     ☐ Specification page(s)_____   ☐ Abstract

     ☐ Drawing page(s)_____   ☐ Claim(s)

☐ Not reproducible   <u>Section</u>

     <u>Reason</u>   ☐ Specification page(s)_____

     ☐ Paper too thin   ☐ Drawing page(s)_____

     ☐ Glossy pages   ☐ Abstract

     ☐ Non-white background   ☐ Claim(s)

☐ Drawing objection(s)

     ☐ Missing lead lines, drawing(s)_____

     ☐ Line quality is too light, drawing(s)_____

     ☐ More than 1 drawing and not numbered correctly

     ☐ Non-English text, drawing(s)_____

     ☐ Excessive text, drawing(s)_____

     ☐ Photographs capable of illustration, drawing(s)_____